

## Design Guidance

### Accommodating Bicycle and Pedestrian Travel:

#### A Recommended Approach A US DOT Policy Statement on Integrating Bicycling and Walking into Transportation Infrastructure

## Purpose

**Accommodating Bicycle and Pedestrian Travel: A Recommended Approach** is a policy statement adopted by the United States Department of Transportation. USDOT hopes that public agencies, professional associations, advocacy groups, and others adopt this approach as a way of committing themselves to integrating bicycling and walking into the transportation mainstream.

The Design Guidance incorporates three key principles:

- a) a policy statement that **bicycling and walking facilities will be incorporated into all transportation projects** unless exceptional circumstances exist;
- b) an approach to achieving this policy that has already worked in State and local agencies; and
- c) a series of action items that a public agency, professional association, or advocacy group can take to achieve the overriding goal of improving conditions for bicycling and walking.

The Policy Statement was drafted by the U.S. Department of Transportation in response to Section 1202 (b) of the Transportation Equity Act for the 21st Century (TEA-21) with the input and assistance of public agencies, professional associations and advocacy groups.

## Introduction

Bicycling and walking issues have grown in significance throughout the 1990s. As the new millennium dawns public agencies and public interest groups alike are striving to define the most appropriate way in which to accommodate the two modes within the overall transportation system so that those who walk or ride bicycles can safely, conveniently, and comfortably access every destination within a community.

Public support and advocacy for improved conditions for bicycling and walking has created a widespread acceptance that more should be done to enhance the safety, comfort, and convenience of the nonmotorized traveler. Public opinion surveys throughout the

1990s have demonstrated strong support for increased planning, funding and implementation of shared use paths, sidewalks and on-street facilities.

At the same time, public agencies have become considerably better equipped to respond to this demand. Research and practical experience in designing facilities for bicyclists and pedestrians has generated numerous national, State and local design manuals and resources. An increasing number of professional planners and engineers are familiar with this material and are applying this knowledge in towns and cities across the country.

The 1990 Americans with Disabilities Act, building on an earlier law requiring curb ramps in new, altered, and existing sidewalks, added impetus to improving conditions for sidewalk users. People with disabilities rely on the pedestrian and transit infrastructure, and the links between them, for access and mobility.

Congress and many State legislatures have made it considerably easier in recent years to fund nonmotorized projects and programs (for example, the Intermodal Surface Transportation Efficiency Act and the Transportation Equity Act for the 21st Century), and a number of laws and regulations now mandate certain planning activities and design standards to guarantee the inclusion of bicyclists and pedestrians.

Despite these many advances, injury and fatality numbers for bicyclists and pedestrians remain stubbornly high, levels of bicycling and walking remain frustratingly low, and most communities continue to grow in ways that make travel by means other than the private automobile quite challenging. Failure to provide an accessible pedestrian network for people with disabilities often requires the provision of costly paratransit service. Ongoing investment in the Nation's transportation infrastructure is still more likely to overlook rather than integrate bicyclists and pedestrians.

In response to demands from user groups that every transportation project include a bicycle and pedestrian element, Congress asked the Federal Highway Administration (FHWA) to study various approaches to accommodating the two modes. The Transportation Equity Act for the 21st Century (TEA-21) instructs the Secretary to work with professional groups such as AASHTO, ITE, and other interested parties to recommend policies and standards that might achieve the overall goal of fully integrating bicyclists and pedestrians into the transportation system.

TEA-21 also says that, "Bicycle transportation facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction of transportation projects, except where bicycle and pedestrian use are not permitted." (Section 1202)

In August 1998, FHWA convened a Task Force comprising representatives from FHWA, AASHTO, ITE, bicycle and pedestrian user groups, State and local agencies, the U.S. Access Board and representatives of disability organizations to seek advice on how to proceed with developing this guidance. The Task Force reviewed existing and proposed information on the planning and technical design of facilities for bicyclists and pedestrians and concluded that these made creation of another design manual unnecessary. For example, AASHTO published a bicycle design manual in 1999 and is working on a pedestrian facility manual.

## **SEC. 1202. BICYCLE TRANSPORTATION AND PEDESTRIAN WALKWAYS.**

(b) Design Guidance.—

(1) In general.—In implementing section 217(g) of title 23, United States Code, the Secretary, in cooperation with the American Association of State Highway and Transportation Officials, the Institute of Transportation Engineers, and other interested organizations, shall develop guidance on the various approaches to accommodating bicycles and pedestrian travel.

(2) Issues to be addressed. —The guidance shall address issues such as the level and nature of the demand, volume, and speed of motor vehicle traffic, safety, terrain, cost, and sight distance.

(3) Recommendations. —The guidance shall include recommendations on amending and updating the policies of the American Association of State Highway and Transportation Officials relating to highway and street design standards to accommodate bicyclists and pedestrians.

(4) Time period for development. —The guidance shall be developed within 18 months after the date of enactment of this Act.

The area where information and guidance was most lacking was in determining when to include designated or special facilities for bicyclists and pedestrians in transportation projects. There can also be uncertainty about the type of facility to provide, and the design elements that are required to ensure accessibility.

For example, when a new suburban arterial road is planned and designed, what facilities for bicyclists and pedestrians should be provided? The task force felt that once the decision to provide a particular facility was made, the specific information on designing that facility is generally available. However, the decision on whether to provide sidewalks on neither, one or both sides of the road, or a shoulder, striped bike lane, wide outside lane or separate trail for bicyclists is usually made with little guidance or help. After a second meeting with the Task Force in January 1999, FHWA agreed to develop a **Policy Statement on Accommodating Bicyclists and Pedestrians in Transportation Projects** to guide State and local agencies in answering these questions. Task Force members recommended against trying to create specific warrants for different facilities (warrants leave little room for engineering judgement and have often been used to avoid providing facilities for bicycling and walking). Instead, the purpose of the Policy Statement is to provide a recommended approach to the accommodation of bicyclists and pedestrians that can be adopted by State and local agencies (as well as professional societies and associations, advocacy groups, and Federal agencies) as a commitment to developing a transportation infrastructure that is safe, convenient, accessible, and attractive to motorized AND nonmotorized users alike. The Policy Statement has four elements:

- a) an acknowledgment of the issues associated with balancing the competing interests of motorized and nonmotorized users;
- b) a recommended policy approach to accommodating bicyclists and pedestrians (including people with disabilities) that can be adopted by an agency or organizations as a statement of policy to be implemented or a target to be reached in the future;
- c) a list of recommended actions that can be taken to implement the solutions and approaches described above; and
- d) further information and resources on the planning, design, operation, and maintenance of facilities for bicyclists and pedestrians.

## **The Challenge: Balancing Competing Interests**

For most of the second half of the 20th Century, the transportation, traffic engineering and highway professions in the United States were synonymous. They shared a singular purpose: building a transportation system that promoted the safety, convenience and comfort of motor vehicles. The post-war boom in car and home ownership, the growth of suburban America, the challenge of completing the Interstate System, and the continued availability of cheap gasoline all fueled the development of a transportation infrastructure focused almost exclusively on the private motor car and commercial truck.

Initially, there were few constraints on the traffic engineer and highway designer. Starting at the centerline, highways were developed according to the number of motor vehicle travel lanes that were needed well into the future, as well as providing space for breakdowns. Beyond that, facilities for bicyclists and pedestrians, environmental mitigation, accessibility, community preservation, and aesthetics were at best an afterthought, often simply overlooked, and, at worst, rejected as unnecessary, costly, and regressive. Many States passed laws preventing the use of State gas tax funds on anything other than motor vehicle lanes and facilities. The resulting highway environment discourages bicycling and walking and has made the two modes more dangerous. Further, the ability of pedestrians with disabilities to travel independently and safely has been compromised, especially for those with vision impairments.

Over time, the task of designing and building highways has become more complex and challenging. Traffic engineers now have to integrate accessibility, utilities, landscaping, community preservation, wetland mitigation, historic preservation, and a host of other concerns into their plans and designs - and yet they often have less space and resources within which to operate and traffic volumes continue to grow.

The additional "burden" of having to find space for pedestrians and bicyclists was rejected as impossible in many communities because of space and funding constraints and a perceived lack of demand. There was also anxiety about encouraging an activity that many felt to be dangerous and fraught with liability issues. Designers continued to design from the centerline out and often simply ran out of space before bike lanes, paved shoulders, sidewalks and other "amenities" could be included.

By contrast, bicycle and pedestrian user groups argue the roadway designer should design highways from the right-of-way limits in, rather than the centerline out. They advocate beginning the design of a highway with the sidewalk and/or trail, including a buffer before the paved shoulder or bike lane, and then allocating the remaining space for motor vehicles. Through this approach, walking and bicycling are positively encouraged, made safer, and included as a critical element in every transportation project rather than as an afterthought in a handful of unconnected and arbitrary locations within a community.

Retrofitting the built environment often provides even more challenges than building new roads and communities: space is at a premium and there is a perception that providing better conditions for bicyclists and pedestrians will necessarily take away space or convenience from motor vehicles.

During the 1990s, Congress spearheaded a movement towards a transportation system that favors people and goods over motor vehicles with passage of the Intermodal Surface Transportation Efficiency Act (1991) and the Transportation Equity Act for the 21st Century (1998). The call for more walkable, liveable, and accessible communities, has seen bicycling and walking emerge as an "indicator species" for the health and well-being of a community. People want to live and work in places where they can safely and conveniently walk and/or bicycle and not always have to deal with worsening traffic congestion, road rage and the fight for a parking space. Vice President Gore launched a Livability Initiative in 1999 with the ironic statement that "a gallon of gas can be used up just driving to get a gallon of milk."

**The challenge for transportation planners, highway engineers and bicycle and pedestrian user groups, therefore, is to balance their competing interest in a limited amount of right-of-way, and to develop a transportation infrastructure that provides access for all, a real choice of modes, and safety in equal measure for each mode of travel.**

This task is made more challenging by the widely divergent character of our nation's highways and byways. Traffic speeds and volumes, topography, land use, the mix of road users, and many other factors mean that a four-lane highway in rural North Carolina cannot be designed in the same way as a four-lane highway in New York City, a dirt road in Utah or an Interstate highway in Southern California. In addition, many different agencies are responsible for the development, management, and operation of the transportation system.

In a recent memorandum transmitting Program Guidance on bicycle and pedestrian issues to FHWA Division Offices, the Federal Highway Administrator wrote that "We expect every transportation agency to make accommodation for bicycling and walking a routine part of their planning, design, construction, operations and maintenance activities." The Program Guidance itself makes a number of clear statements of intent:

- Congress clearly intends for bicyclists and pedestrians to have safe, convenient access to the transportation system and sees every transportation improvement as an opportunity to enhance the safety and convenience of the two modes.
- "Due consideration" of bicycle and pedestrian needs should include, at a minimum, a presumption that bicyclists and pedestrians will be accommodated in the design of new and improved transportation facilities.
- To varying extents, bicyclists and pedestrians will be present on all highways and transportation facilities where they are permitted and it is clearly the intent of TEA-21 that all new and improved transportation facilities be planned, designed and constructed with this fact in mind.
- The decision not to accommodate [bicyclists and pedestrians] should be the exception rather than the rule. There must be exceptional circumstances for denying bicycle and pedestrian access either by prohibition or by designing highways that are incompatible with safe, convenient walking and bicycling.

The Program Guidance defers a suggested definition of what constitutes "exceptional circumstances" until this Policy Statement is completed. However, it does offer interim guidance that includes controlled access highways and projects where the cost of accommodating bicyclists and pedestrians is high in relation to the overall project costs and likely level of use by nonmotorized travelers.

Providing access for people with disabilities is a civil rights mandate that is not subject to limitation by project costs, levels of use, or "exceptional circumstances". While the Americans with Disabilities Act doesn't require pedestrian facilities in the absence of a pedestrian route, it does require that pedestrian facilities, when newly constructed or altered, be accessible.

## **Policy Statement**

1. Bicycle and pedestrian ways shall be established in new construction and reconstruction projects in all urbanized areas unless one or more of three conditions are met:

- bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the right of way or within the same transportation corridor.
- the cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Excessively disproportionate is defined as exceeding twenty percent of the cost of the larger transportation project.
- where sparsity of population or other factors indicate an absence of need. For example, the Portland Pedestrian Guide requires "all construction of new public streets" to include sidewalk improvements on both sides, unless the street is a cul-de-sac with four or fewer dwellings or the street has severe topographic or natural resource constraints.

2. In rural areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day, as in States such as Wisconsin. Paved shoulders have safety and operational advantages for all road users in addition to providing a place for bicyclists and pedestrians to operate. Rumble strips are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of four feet in which a bicycle may safely operate.

3. Sidewalks, shared use paths, street crossings (including over- and undercrossings), pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated and maintained so that all pedestrians, including people with disabilities, can travel safely and independently.

4. The design and development of the transportation infrastructure shall improve conditions for bicycling and walking through the following additional steps:

- planning projects for the long-term. Transportation facilities are long-term investments that remain in place for many years. The design and construction of new facilities that meet the criteria in item 1) above should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements. For example, a bridge that is likely to remain in place for 50 years, might be built with sufficient width for safe bicycle and pedestrian use in anticipation that facilities will be available at either end of the bridge even if that is not currently the case.
- addressing the need for bicyclists and pedestrians to cross corridors as well as travel along them. Even where bicyclists and pedestrians may not commonly use a particular travel corridor that is being improved or constructed, they will likely need to be able to cross that corridor safely and conveniently. Therefore, the design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is safe, accessible and convenient.
- getting exceptions approved at a senior level. Exceptions for the non-inclusion of bikeways and walkways shall be approved by a senior manager and be documented with supporting data that indicates the basis for the decision.
- designing facilities to the best currently available standards and guidelines. The design of facilities for bicyclists and pedestrians should follow design guidelines and standards that are commonly used, such as the AASHTO *Guide for the Development of Bicycle Facilities*, AASHTO's *A Policy on Geometric Design of Highways and Streets*, and the ITE Recommended Practice *"Design and Safety of Pedestrian Facilities"*.

## Policy Approach

### "Rewrite the Manuals" Approach

Manuals that are commonly used by highway designers covering roadway geometrics, roadside safety, and bridges should incorporate design information that integrates safe



and convenient facilities for bicyclists and pedestrians -- including people with disabilities - into all new highway construction and reconstruction projects.

In addition to incorporating detailed design information - such as the installation of safe and accessible crossing facilities for pedestrians, or intersections that are safe and convenient for bicyclists - these manuals should also be amended to provide flexibility to the highway designer to develop facilities that are in keeping with transportation needs, accessibility, community values, and aesthetics. For example, the Portland Pedestrian Design Guide (June 1998) applies to every project that is designed and built in the city, but the Guide also notes that:

"Site conditions and circumstances often make applying a specific solution difficult. The Pedestrian Design Guide should reduce the need for ad hoc decision by providing a published set of guidelines that are applicable to most situations. Throughout the guidelines, however, care has been taken to provide flexibility to the designer so she or he can tailor the standards to unique circumstances. Even when the specific guideline cannot be met, the designer should attempt to find the solution that best meets the pedestrian design principles described [on the previous page]"

In the interim, these manuals may be supplemented by stand-alone bicycle and pedestrian facility manuals that provide detailed design information addressing on-street bicycle facilities, fully accessible sidewalks, crosswalks, and shared use paths, and other improvements.

Examples: Florida DOT has integrated bicycle and pedestrian facility design information into its standard highway design manuals and New Jersey DOT is in the process of doing so. Many States and localities have developed their own bicycle and pedestrian facility design manuals, some of which are listed in the final section of this document.

### **Applying Engineering Judgement to Roadway Design**

In rewriting manuals and developing standards for the accommodation of bicyclists and pedestrians, there is a temptation to adopt "typical sections" that are applied to roadways without regard to travel speeds, lane widths, vehicle mix, adjacent land uses, traffic volumes and other critical factors. This approach can lead to inadequate provision on major roads (e.g. a four foot bike lane or four foot sidewalk on a six lane high-speed urban arterial) and the over-design of local and neighborhood streets (e.g. striping bike lanes on low volume residential roads) , and leaves little room for engineering judgement. After adopting the policy that bicyclists and pedestrians (including people with disabilities) will be fully integrated into the transportation system, State and local governments should encourage engineering judgement in the application of the range of available treatments.



For example:

- Collector and arterial streets shall typically have a minimum of a four foot wide striped bicycle lane, however wider lanes are often necessary in locations with parking, curb and gutter, heavier and/or faster traffic.
- Collector and arterial streets shall typically have a minimum of a five foot sidewalk on both sides of the street, however wider sidewalks and landscaped buffers are necessary in locations with higher pedestrian or traffic volumes, and/or higher vehicle speeds. At intersections, sidewalks may need to be wider to accommodate accessible curb ramps.
- Rural arterials shall typically have a minimum of a four foot paved shoulder, however wider shoulders (or marked bike lanes) and accessible sidewalks and crosswalks are necessary within rural communities and where traffic volumes and speeds increase.

This approach also allows the highway engineer to achieve the performance goal of providing safe, convenient, and comfortable travel for bicyclists and pedestrians by other means. For example, if it would be inappropriate to add width to an existing roadway to stripe a bike lane or widen a sidewalk, traffic calming measures can be employed to reduce motor vehicle speeds to levels more compatible with bicycling and walking.

## **Actions**

The United States Department of Transportation encourages States, local governments, professional associations, other government agencies and community organizations to adopt this Policy Statement as an indication of their commitment to accommodating bicyclists and pedestrians as an integral element of the transportation system. By so doing, the organization or agency should explicitly adopt one, all, or a combination of the various approaches described above AND should be committed to taking some or all of the actions listed below as appropriate for their situation.

- a) Define the exceptional circumstances in which facilities for bicyclists and pedestrians will NOT be required in all transportation projects.
- b) Adopt new manuals, or amend existing manuals, covering the geometric design of streets, the development of roadside safety facilities, and design of bridges and their approaches so that they comprehensively address the development of bicycle and pedestrian facilities as an integral element of the design of all new and reconstructed roadways.
- c) Adopt stand-alone bicycle and pedestrian facility design manuals as an interim step towards the adoption of new typical sections or manuals covering the design of streets and highways.
- d) Initiate an intensive re-tooling and re-education of transportation planners and engineers to make them conversant with the new information required to accommodate bicyclists and pedestrians. Training should be made available for, if not required of, agency traffic engineers and consultants who perform work in this field.

## Conclusion

There is no question that conditions for bicycling and walking need to be improved in every community in the United States; it is no longer acceptable that 6,000 bicyclists and pedestrians are killed in traffic every year, that people with disabilities cannot travel without encountering barriers, and that two desirable and efficient modes of travel have been made difficult and uncomfortable.

Every transportation agency has the responsibility and the opportunity to make a difference to the bicycle-friendliness and walkability of our communities. The design information to accommodate bicyclists and pedestrians is available, as is the funding. The United States Department of Transportation is committed to doing all it can to improve conditions for bicycling and walking and to make them safer ways to travel.

## Further Information and Resources

### General Design Resources

*A Policy on Geometric Design of Highways and Streets*, 1994 (The Green Book). American Association of State Highway and Transportation Officials (AASHTO), P.O. Box 96716, Washington, DC, 20090-6716, Phone: (888) 227-4860.

*Highway Capacity Manual, Special Report 209*, 1994. Transportation Research Board, Box 289, Washington, DC 20055, Phone: (202) 334-3214. Next Edition: FHWA Research Program project has identified changes to HCM related to bicycle and pedestrian design.

*Manual on Uniform Traffic Control Devices*, 1988. Federal Highway Administration (FHWA), Superintendent of Documents. P.O. Box 371954, Pittsburgh, PA 15250-7954. Next Edition: 2000, will incorporate changes to Part IX that will soon be subject of Notice of Proposed Rulemaking.

*Flexibility in Highway Design*, 1997. FHWA. HEP 30, 400 Seventh Street SW, Washington, DC 20590.

### Pedestrian Facility Design Resources

*Design and Safety of Pedestrian Facilities, A Recommended Practice*, 1998. Institute of Transportation Engineers, 525 School Street, S.W, Suite 410, Washington, DC 20024-2729, Phone: (202) 554-8050.

*Pedestrian Compatible Roadways-Planning and Design Guidelines*, 1995. Bicycle / Pedestrian Transportation Master Plan, Bicycle and Pedestrian Advocate, New Jersey Department of Transportation, 1035 Parkway Avenue, Trenton, NJ 08625, Phone: (609) 530-4578.

*Improving Pedestrian Access to Transit: An Advocacy Handbook*, 1998. Federal Transit Administration / WalkBoston. NTIS, 5285 Port Royal Road, Springfield, VA 22161.

*Planning and Implementing Pedestrian Facilities in Suburban and Developing Rural Areas, Report No. 294A*, Transportation Research Board, Box 289, Washington, DC 20055, Phone: (202) 334-3214.

*Pedestrian Facilities Guidebook*, 1997. Washington State Department of Transportation, Bicycle and Pedestrian Program, P.O. Box 47393, Olympia, WA 98504.

*Portland Pedestrian Design Guide*, 1998. Portland Pedestrian Program, 1120 SW Fifth Ave, Room 802; Portland, OR 97210. (503) 823-7004.

\* *Implementing Pedestrian Improvements at the Local Level*, 1999. FHWA, HSR 20, 6300 Georgetown Pike, McLean, VA .

\* *AASHTO Guide to the Development of Pedestrian Facilities*, 2000. AASHTO. (currently under discussion)

### **Bicycle Facility Design Resources**

*Guide for the Development of Bicycle Facilities*, 1999., American Association of State Highway and Transportation Officials (AASHTO), P.O. Box 96716, Washington, DC, 20090-6716, Phone: (888) 227-4860.

*Implementing Bicycle Improvements at the Local Level*, (1998), FHWA, HSR 20, 6300 Georgetown Pike, McLean, VA .

*Bicycle Facility Design Standards*, 1998. City of Philadelphia Streets Department, 1401 JFK Boulevard, Philadelphia, PA 19103.

*Selecting Roadway Design Treatments to Accommodate Bicyclists*, 1993. FHWA, R&T Report Center, 9701 Philadelphia Ct, Unit Q; Lanham, MD 20706. (301) 577-1421 (fax only)

*North Carolina Bicycle Facilities Planning and Design Guidelines*, 1994. North Carolina DOT, P.O. Box 25201, Raleigh, NC 27611. (919) 733-2804.

*Bicycle Facility Planning*, 1995. Pinsof & Musser. American Planning Association, Planning Advisory Service Report # 459. American Planning Association, 122 S. Michigan Ave, Suite 1600; Chicago, IL 60603.

*Florida Bicycle Facilities Planning and Design Manual*, 1994. Florida DOT, Pedestrian and Bicycle Safety Office, 605 Suwannee Street, Tallahassee, FL 32399.

*Evaluation of Shared-use Facilities for Bicycles and Motor Vehicles*, 1996. Florida DOT, Pedestrian and Bicycle Safety Office, 605 Suwannee Street, Tallahassee, FL 32399.

### **Bicycle and Pedestrian Design Resources**

*Oregon Bicycle and Pedestrian Plan*, 1995. Oregon Department of Transportation, Bicycle and Pedestrian Program, Room 210, Transportation Building, Salem, OR 97310, Phone: (503) 986-3555

*Improving Conditions for Bicyclists and Pedestrians, A Best Practices Report*, 1998. FHWA, HEP 10, 400 Seventh Street SW, Washington, DC 20590.

### **Traffic Calming Design Resources**

*Traffic Calming: State of the Practice*. 1999. Institute of Transportation Engineers, 525 School Street, SW, Suite 410; Washington, DC 20024.

*Florida Department of Transportation's Roundabout Guide*. Florida Department of Transportation, 605 Suwannee St., MS-82, Tallahassee, FL 32399-0450.

*National Bicycling and Walking Study. Case Study # 19, Traffic Calming and Auto-Restricted Zones and other Traffic Management Techniques-Their Effects on Bicycling and Pedestrians*, Federal Highway Administration (FHWA).

*Traffic Calming* (1995), American Planning Association, 122 South Michigan Avenue, Chicago, IL 60603

*Traditional Neighborhood Development Street Design Guidelines*, 1997. Proposed Recommended Practice, Institute of Transportation Engineers, 525 School Street, SW, Suite 410; Washington, DC 20024.

*Making Streets that Work*, City of Seattle, 600 Fourth Ave., 12th Floor, Seattle, WA 98104-1873, Phone: (206) 684-4000, Fax: (206) 684-5360.

*Traffic Control Manual for In-Street Work*, 1994. Seattle Engineering Department, City of Seattle, 600 4th Avenue, Seattle, WA 98104-6967, Phone: (206) 684-5108.

### **ADA-related Design Resources**

*Accessible Pedestrian Signals*, 1998. U.S. Access Board 1331 F Street NW, Suite 1000; Washington, DC 20004. (800) 872-2253.

*Accessible Rights of Way: A Design Manual*, 1999. U.S. Access Board, 1331 F Street NW, Suite 1000; Washington, DC 20004. (800) 872-2253.

*Designing Sidewalks and Trails for Access, Part One*. 1999. FHWA, HEPH-30, 400 Seventh Street SW, Washington, DC 20590.

*ADA Accessibility Guidelines for Buildings and Facilities*, 1998 (ADAAG). U.S. Access Board, 1331 F Street NW, Suite 1000; Washington, DC 20004. (800) 872-2253.

*Uniform Federal Accessibility Standards*, 1984 (UFAS), available from the U.S. Access Board, 1331 F Street NW, Suite 1000; Washington, DC 20004. (800) 872-2253

*Universal Access to Outdoor Recreation: A Design Guide*, 1993. PLAE, Inc, MIG Communications, 1802 Fifth Street, Berkeley, CA 94710. (510) 845-0953.  
*Recommended Street Design Guidelines for People Who Are Blind or Visually Impaired*. American Council of the Blind, 1155 15th Street NW, Suite 720; Washington, DC 20005. (202) 467-5081.

### **Trail Design Resources**

*Trails for the 21st Century*, 1993. Rails to Trails Conservancy, 1100 17th Street NW, 10th Floor, Washington DC 20036. (202) 331-9696.

*Greenways: A Guide to Planning, Design, and Development*, 1993. The Conservation Fund. Island Press, 1718 Connecticut Ave NW, Suite 300; Washington, DC 20009.

*Trail Intersection Design Guidelines*, 1996. Florida Department of Transportation, 605 Suwannee St., MS-82, Tallahassee, FL 32399-0450.

\* Indicates publication not yet available